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Elements Related to Student Success in Schooling and Education

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Alberta

Minister's Advisory Committee
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ELEMENTS RELATED TO STUDENT SUCCESS IN SCHOOLING AND EDUCATION

A paper presented for the consideration
of the Minister's Advisory Committee on
Student Achievement

- by -

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PREFACE

The Minister's Advisory Committee on Student Achievement (MACOSA) was established by ministerial order in October 1976 in response to growing concerns expressed by the public at large, government, labor, business, students and educators regarding the quality and standards of basic education in Alberta.

MACOSA commissioned a number of studies, primarily to provide basic information for a summary of current levels of achievement in Alberta and to provide baseline data for future assessment. These studies fell into three categories: 1) preliminary studies, 2) achievement studies, and 3) other studies.

The purpose of this study, Elements Related to Student Success in Schooling and Education is to summarize the research into schooling that has shed some light on how educational outcomes are related to such variables as community, home and student characteristics, school facilities and school personnel services.

This report, which represents the findings and conclusions of the researcher, was presented to MACOSA as information.

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CHAPTER I

INTRODUCTION

A major aspect of the recent publication, The Goals of Basic Education for Alberta, (Alberta Education, 1978) is the dichotomization of the goals into 1) Goals of Schooling, and 2) Goals of Education. The view is that certain goals are the primary and distinct responsibility of the school and the broader goals of education are a shared responsibility of the community (including the school). The Goals publication includes the statement that "maximum learning occurs when the efforts and expectations of various agencies affecting children complement each other" (p.2). Complementary to the concept of, "shared responsibilities," is the collection of goals covering all the competencies, skills, knowledge and attitudes deemed necessary to help the student "fulfill his personal aspiration while making a positive contribution to society."

Implied or stated in this document are four major areas of consideration: 1) Shared responsibility for student success (community, home, school), 2) Key areas of responsibility for each of the publics, 3) Identified goals indicate desired student competencies and can guide and determine what should be evaluated, and 4) The needs of society dictate the need for goals in a wide variety of areas which go beyond the traditional cognitive domain, viz. affective, process and psychomotor.

In considering these four areas the following problems should be considered: 1) What elements are important for student success in the learning process? 2) To what degree does each public deal with the different elements? Coldiron and Skiffington emphasize this point in stating, "There are some very real limits to what schooling can do for society. It is time to face up to what these limits are" (1975, p.18). 3) Are we meeting success in achieving and evaluating our goals? Inherent in these problems are the questions: "Is the complete spectrum (cognitive, affective, process, psychomotor) of goals or outcomes of education evaluated? What standards do we have to indicate successful achievement of objectives or goals?" Although evaluation may seem somewhat lower in importance than the identification of key areas or elements which affect student success it is frequently the evaluation techniques which dictate the practices which precede them. Thus objectives which state the need for student success in developing knowledge, learning skills and physical skills assume importance and provide the basis for some form of evaluation and the use of standards.

This paper, via a search of the literature, will look at the elements from education and the broader environment in which students live which are related to the student's success. Knowledge about this combination of elements has application both in providing effective instruction and in making judgements about (evaluating) student achievement.

Statement of the Problem

Specifically, this paper will deal with the problem: Which elements indicative of student success can be identified that relate a) to the school, and b) to the home and community?

In studying this problem other areas must be considered: What areas of student success have been measured? What areas of student success should be measured? The major task of reviewing the literature is to find the current state of knowledge about student achievement relative to the elements associated with the school, and home and community. Other purposes include identifying joint effects on student development of factors originating in the school and outside formal education settings.

Definitions

Elements Related to Student Success

These are all the variables or factors which are found in the literature to be correlated, either positively or negatively, to measures of student success. Cause-effect relationships should not be assumed from these findings.

Areas or Domains of Education

In this paper four outcomes of education will be considered: cognitive, affective, psychomotor and process. The first three are used in the traditional modes; process is used to indicate the skills of investigation, inquiry, or problem solving. Process skills include: problem identification, hypothesizing or speculating, designing ways to find answers, observing, interpreting, and analyzing the completed investigation and considering the need for further investigation (openendedness).

Limitations

Whether or not there is a correlation between specified elements in a student's environment and particular outcomes of education will be used to indicate possible relationships. The exact numerical correlations (which are indicators of the strengths of the association) are often not reported. Hence, they will be reported as either 1) positive (+s), 2) negative (-s), 3) existing, but direction (positive or negative) not known (s) or 4) no correlation (ns). Thus the reader is cautioned to remember two things: 1) the strength of the relationship is not always reported in the literature and 2) a correlation does not mean a cause and effect relationship exists. For example, a significantly positive correlation (0.49) was reported between whether or not a student pre-registered for high school and his achievement in junior high school (Churchman, et al. 1975). This doesn't mean your chances of success in junior high will necessarily be improved if you fill in the registration forms for high school; it seems more logical to assume that those students who were sure they would do well in junior high school decided to enrol in high school. Also, note the strength of the correlation; if used as a single predictor it should be over .70 if one is to account for more than 50 percent of the variance in achievement. If the coefficient is this large one knows 50 percent of what is required to predict accurately.

Significance of the Study

The Goals of Basic Education for Alberta (Alberta Education, 1978) indicates the variety of needs of the individual and society and the desirability of having the various agencies affecting children complement each other. It is thus desirable to identify the elements or variables from the various agencies related to student success; this study attempts to do this.

Subsequently this information can be used to identify the key elements in a given learning environment and predict student success relative to them. Such predictions could be used as expectations or standards in evaluating and reporting student achievement.

CHAPTER II

ORGANIZATION AND CATEGORIZATION OF ELEMENTS

In reviewing the literature it appears elements affecting student behavior may be organized into two main areas: one concerned with those elements directly related to the educational scene, and one concerned with the environmental elements influencing the student. That is, one set of elements is most clearly identifiable as being related to the ongoing educational process and a second set of elements can be related to the environment external to the formal educational scene.

In this paper these areas will be identified as: 1) Educational Elements over which officials directly concerned with formal education have some control and 2) Environmental Elements external to the formal educational scene indicative of variables that influence that which the student brings with him to the classroom or formal educational scene.

In addition to these "environmental elements" or that which the student brings with him to the school and in addition to the "educational elements" characterizing the formal educational system one must be concerned with the outcomes of education. The intended outcomes are specified by the goals of education and appear to encompass four areas or domains: cognitive, affective, process and psychomotor. (These will be discussed later.)

A later section of this paper tabulates the results based on a review of fifty-three studies (see References and Bibliography) indicating areas in which research has been done relative to environmental elements, educational elements and educational outcomes. (Fifty-four entries appear in the "References and Bibliography" section because of the extra reference to The Goals of Basic Education for Alberta.

Environmental Elements

Variables from the student's environment not directly controlled by the formal educational system can be organized under four hierarchical areas as indicated in Table 1.

Table 1

ENVIRONMENTAL ELEMENTS RELATED TO STUDENT BEHAVIOR: MAJOR CATEGORIES

1. Population Characteristics
2. Community Characteristics
3. Home Characteristics
4. Student Characteristics

The categories of environmental factors are described in amplified form in Table 2. The specific variables used by investgators referenced in this review are subsumed within each category. Nearly fifty elements used as environment indicators are tabulated.

To know the effect these different elements have on the student's behavior (criterion variable) it is necessary to put into perspective the roles of each set of agencies (community, home, school, etc.) involved in the education of youth. Thus we have an interest in the effects the elements from the environment have on student behavior. In summary form these relationships might be represented by a 4 X 4 matrix as shown in Figure 1.

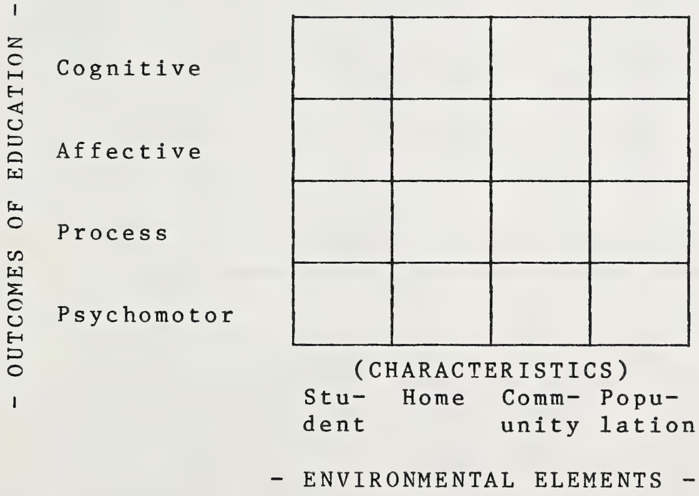

Figure 1
Matrix of Environmental Elements and Educational Outcomes

Table 2

SPECIFIC ENVIRONMENTAL ELEMENTS STUDIED
IN RELATION TO STUDENT ACHIEVEMENT

Population Characteristics	Community Characteristics	Home Characteristics	Student Characteristics
1. Achievement mix	1. Housing type	1. Socio-economic status factors: a. Parent's occupation b. Parent's education c. Income d. Material possessions	1. Academic readiness: a. I.Q. b. Composite test scores c. Previous test scores d. Previous education levels e. Kindergarten
2. Racial mix	2. Race and culture	2. Reading material available	2. Motivation: a. Lateness, attendance b. Study habits c. Job attitudes d. Plans, expectations e. Attitude f. Registered for high school
3. Socio-economic mix	3. Community type: rural, urban	3. Political preference and knowledge	3. Social existence: a. Clique membership b. Social Values c. Delinquency d. Drug usage e. Other activities f. Disruptive actions g. Part-time work h. Time for school and homework i. Mobility

Table 2 (Cont'd)

SPECIFIC ENVIRONMENTAL ELEMENTS STUDIED
IN RELATION TO STUDENT ACHIEVEMENT

Population Characteristics	Community Characteristics	Home Characteristics	Student Characteristics
4.	4. Education plans	4. Religious preference and knowledge	4. Personal Characteristics: a. I.Q. b. Age c. Sex d. Race e. Second generation
	5. Socio-economic mix	5. a. Family intact b. Divorced	
	6. Median achievement mix	6. a. Real or surrogate mother at home b. Working mother	
	7. Per capita income	7. Overcrowding	
	8. Residents listed in Who's Who	8. Family size	
	9. Large school enrollment	9. Parental attitude: a. Expectation b. Attitude towards education c. Aspirations	
		10. Home climate	

Each cell in the matrix represents a potential relationship between an Environmental Element and an Educational Outcome. Whether or not any environmental element "causes" any outcome is an empirical question which must be studied by experimental means. Even though a cause-effect relationship may not have been established the relationship may still be useful; it may be used to help predict and to set an expectation or standard in evaluating and reporting student achievement.

Educational Elements

The formal education system constitutes another set of elements designed to produce changes in student behavior; these are predominatly school related variables. In this paper six major areas are utilized to classify Educational Elements or elements controlled by the formal education system (see Table 3).

Table 3

EDUCATIONAL ELEMENTS: MAJOR CATEGORIES

School Facilities
School Personnel Services
Teacher Related Variables
Structure of Teaching Learning Situation
Curriculum

As with the Environmental Elements the major interest is the influence these school system related variables may have on student behaviors or Educational Outcomes. As previously, a matrix may be used to summarize the relationships between these two areas: Educational Elements and Educational Outcomes. See Figure 2.

- OUTCOMES OF EDUCATION -

	School Facilities	Personnel Services	Teacher Related	Teaching Learning Sit.	Curriculum
Cognitive					
Affective					
Process					
Psychomotor					

- EDUCATIONAL ELEMENTS -

Figure 2
Matrix of Educational Elements and
Educational Outcomes

The foregoing major categories used for representing school-based elements related to student achievement are delineated in greater detail in Tables 4-8. The enumerations represent a preview of some of the findings from this review since the listings are of elements used by investigators in the reports studied. As with environmental elements, the literature reviewed identified about fifty educational elements which were studied as correlates of student achievement.

Table 4

SCHOOL FACILITIES: INDICATORS USED AS PREDICTORS OF STUDENT DEVELOPMENT

1. Age of building, value, maintenance
2. Auxiliary facilities
   a. Gym
   b. Cafeteria
   c. Library
3. Size and Location
   a. Site size
   b. Number of pupils
   c. Number of pupils per teacher
   d. Class size
4. Transportation
   a. Expenditure
5. Net expenditures

Table 5

SCHOOL PERSONNEL SERVICES: INDICATORS USED AS PREDICTORS OF STUDENT DEVELOPMENT

1. Counselling
   a. Accessability
2. Number of specialists
   a. Number of pupil services
   b. Programs for the handicapped

Table 6

TEACHER RELATED VARIABLES: INDICATORS USED

---

1. Instructional costs (salaries)

2. Teacher stability

    a. Percent of transfers
    b. Turnover rate

3. Teacher satisfaction related to

    a. Students
    b. Parents
    c. Administration

        1) Qualifications of principal
        2) Administrator type
        3) Perceptions of staff need
        4) Higher personnel ratings

    d. Teaching load

4. Qualifications

    a. Years of training, number of degrees
    b. Quality of training
    c. Years of experience
    d. Uncertified teachers
    e. Inservices
    f. Hours of practice teaching
    g. Others

        1) Travel
        2) Reading

5. Teacher background and characteristics

    a. Social class
    b. Sex
    c. Parent's education
    d. Race
    e. Married
    f. Age

Table 7

STRUCTURE OF TEACHING-LEARNING SITUATION: INDICATORS USED TO PREDICT STUDENT DEVELOPMENT

1. Classroom Climate

    a. Teacher expectations
    b. Teacher perceptions
    c. Environment (warmth, praise)
    d. Control
    e. Disorganization
    f.

2. Classroom Practices

    a. Grouping (ability, etc.)
    b. Oral reading
    c.

3. Matching of students with desired learning situation

Table 8

CURRICULUM INDICATORS USED TO PREDICT STUDENT SUCCESS

1. Currency of program

2. Innovation and the use of new materials

3. Quality

4. Number of credits offered

5. Closeness to real life

Thus it is hypothesized that the various elements classified as either Educational or Environmental are related to the Outcomes of Education. The complexities of these associations are indicated in Figures 1 and 2. Figure 3 introduces another possibility: the Educational and Environmental Elements also interact and this interaction is related to the student's success as indicated by the Outcomes of Education. For example, the student's socio-economic status (Environmental Element) may indicate a certain type of teaching-learning situation (Educational Element) is desirable to optimize the chance for student success.

Figure 3 is a simplified model of the interactions in the educational process and will be more fully developed in this chapter. This representation indicates that educational elements and environmental factors may, singly, be associated with student development. In addition, there may be a joint (interaction) relationship between the two types of elements and outcomes.

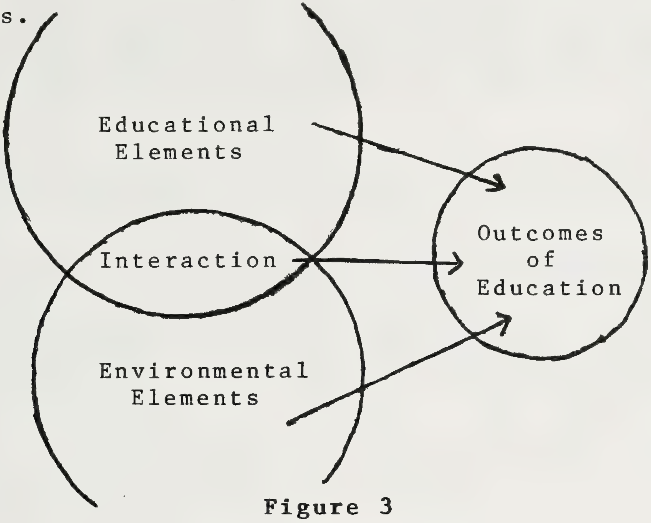

Figure 3
Elements And Outcomes Of Education

Outcomes of Schooling and Education

The third area of interest is the results or outcomes of the student's education. These can also be called Criteria Variables in that they are used to determine the degree of success related to each of 1) The Environmental Elements, 2) The Educational Elements and 3) the interaction between these. The four major areas or domains in which outcomes may be classified are cognitive, affective, process and psychomotor.

Goals are statements which indicate what is to be achieved or worked toward. The domains in which these goals can be measured are infrequently delimited by definite boundaries. For example, the goal, develop knowledge, skills, attitudes and habits which contribute to physical and mental health and safety implies cognitive (knowledge), psychomotor (skills) and affective (attitudes and habits) components. These are the three traditional domains of learning. However, the word "skills" as used here could refer to a set of thinking processes in addition to psychomotor skills. This is another area or domain not included in the traditional three: cognitive, affective and psychomotor. Other objectives such as, "Develop learning skills of finding, organizing, analyzing, and applying information in a critical and objective manner" (Torgunrud, 1977) strongly indicate an area of learning with distinct characteristics different from those normally associated with the affective, cognitive and psychomotor domains. To emphasize the importance of objectives dealing with processes such as those mentioned above and with processes or skills required to satisfy other related objectives (e.g. "Develop the ability to understand and respond to change as it occurs in personal life and in society", Torgunrud, 1977) this fourth domain entitled, "Process Skills" has been added to the other three.

Table 9 contains the, "Goals of Schooling" from the publication, The Goals of Basic Education For Alberta 1978, and Table 10 contains the "Goals of Education" from the same publication. Table 11 summarizes these goals as they relate to the four domains of the Outcomes of Education.

Of particular interest in Table 11 is the number of goals in each of the outcome categories. As a validity test, when several Alberta Department of Education consultants were asked to categorize the goals under the four headings a very high consistency resulted.

Table 9

GOALS OF SCHOOLING

Schooling, as part of education, accepts primary and distinctive responsibility for specific goals basic to the broader goals of education. Programs and activities shall be planned, taught, and evaluated on the basis of these specific goals in order that students:

1. Develop competencies in reading, writing, speaking, listening and viewing.

2. Acquire basic knowledge and develop skills and attitudes in mathematics, the practical and fine arts, the sciences, and the social studies (including history and geography), with appropriate local, national, and international emphasis in each.

3. Develop the learning skills of finding, organizing, analyzing and applying information in a critical and objective manner.

4. Acquire knowledge and develop skills, attitudes and habits which contribute to physical, and social well-being.

5. Develop an understanding of the meaning, responsibilities, and benefits of active citizenship at the local, national, and international levels.

6. Acquire knowledge and develop skills, attitudes, and habits required to respond to the opportunities and expectations of the world of work.

Because the above goals are highly interrelated, each complementing and reinforcing the others, priority ranking among them is not suggested. It is recognized that in sequencing learning activities for students some goals are emphasized earlier than others; however, in relation to the total years of schooling, they are of equal importance.

In working toward the attainment of its goals, the school will strive for excellence. However, the degree of individual achievement also depends on student ability and motivation as well as support from the home. Completion of diploma requirements is expected to provide the graduate with basic preparations for lifelong learning. Dependent on program choices, the diploma also enables job entry or further formal study.

Table 10

GOALS OF EDUCATION

Achievement of the broader goals of education must be viewed as a shared responsibility of the community. Maximum learning occurs when the efforts and expectations of various agencies affecting children complement each other. Recognizing the learning that has or has not occurred through various community influences, among which the home is most important, the school will strive to:

1. Develop intellectual curiosity and desire for lifelong learning.

2. Develop the ability to get along with people of varying backgrounds, beliefs and lifestyles.

3. Develop a sense of community responsibility which embraces respect for law and authority, public and private property, and the rights of others.

4. Develop self-discipline, self-understanding, and a positive self-concept through realistic appraisal of one's capabilities and limitations.

5. Develop an appreciation for tradition and the ability to understand and respond to change as it occurs in personal life and in society.

6. Develop skills for effective utilization of financial resources and leisure time and for constructive involvement in community endeavors.

7. Develop an appreciation for the role of the family in society.

8. Develop an interest in cultural and recreational pursuits.

9. Develop a commitment to the careful use of natural resources and to the preservation and improvement of the physical environment.

10. Develop a sense of purpose in life and ethical or spiritual values which respect the worth of the individual, justice, fair play and fundamental rights, responsibilities and freedoms.

The ultimate aim of education is to develop the abilities of the individual in order that he might fulfill his personal aspirations while making a positive contribution to society.

Table 11

THE GOALS* OF SCHOOLING AND EDUCATION CLASSIFIED ACCORDING TO THE FOUR DOMAINS OF THE OUTCOMES OF EDUCATION

GOALS	OUTCOMES OF EDUCATION			
	Cognitive	Affective	Process	Psychomotor
Goals of Schooling	1	(1)**	(1)	(1)
	2	2	(2)	(2)
	(3)	3	3	
	4	4	4	4
	(5)	5	(5)	
	6	6	6	6
Goals of Education	(1)	1	(1)	
	(2)	2	(2)	
	(3)	3	(3)	
	(4)	4	(4)	(4)
	(5)	(5)	5	
	6	(6)	(6)	(6)
	(7)	7	(7)	
	8	8		
	9	9	(9)	
	(10)	10	(10)	

* From, The Goals of Basic Education for Alberta, 1978.

** Parentheses indicate the goal is less applicable for that particular Outcome Category.

NOTE: the number of goals in each of the Outcome categories. When several regional office consultants were asked to categorize the goals a remarkable consistency of opinion occurred.

A problem immediately arises: Can the educational outcomes be ascertained in each of the four domains? The review of the literature indicates the emphasis which has been put on each of the four domains and thus is indicative of the current extent to which they are measured. Further, the research helps define the meaning of the four domains by identifying indicators used under each. Table 12 lists the four domains and some of the indicators used by researchers in each of the domains.

Most of the research has been centred around the cognitive domain. Evaluation in the affective domain is increasing but process and psychomotor areas are only rarely utilized in the research reviewed for this study. Thus elements that are related to student success will be reported only in the cognitive and affective domains.

Table 12

OUTCOMES OF EDUCATION: FOUR DOMAINS AND INDICATORS USED IN THEIR MEASUREMENT

DOMAIN	INDICATORS
Cognitive	1. I.Q. scores 2. Grade point average (achievement) 3. Reading scores 4. Math scores 5. Achievement growth 6. Verbal scores 7. Reasoning (mechanical, abstract) 8. Vocational development
Affective	1. Satisfaction 2. Creativity 3. Self-concept 6. Academic interest and aspiration 5. Citizenship 4. Attitude towards school and learning 7. Motivation 8. Attendance
Process	1. Inquiry or investigation skills
Psychomotor	

Interactions in the Educational Process

As indicated in Figure 3, not only can the two sets of predictor elements (Environment and Educational) affect the outcomes of education (criterion variables) but they can also interact with each other. This interaction of predictors may be of importance in identifying key elements related to student educational success.

The model in Figure 4 illustrates in more detail the possibilities of interactions in the educational process. For example, students may be found to score higher on an attitude test (Outcomes of Education) when their home is characterized by two parents (Environmental Elements) as opposed to one or none. However, the structure of the teaching-learning situation (Educational Elements) may also be of importance in this situation and may, in combination with the environmental elements, be related to outcomes. These more complex interactions are frequently not considered. Ideally one should use an experimental approach and should identify and control all variables in any research project. Recognizing the near impossibility of doing this, the careful scrutiny of any research design becomes important before interpreting results.

To most accurately interpret any specific relationship reported in this study the reader should refer to the original research.

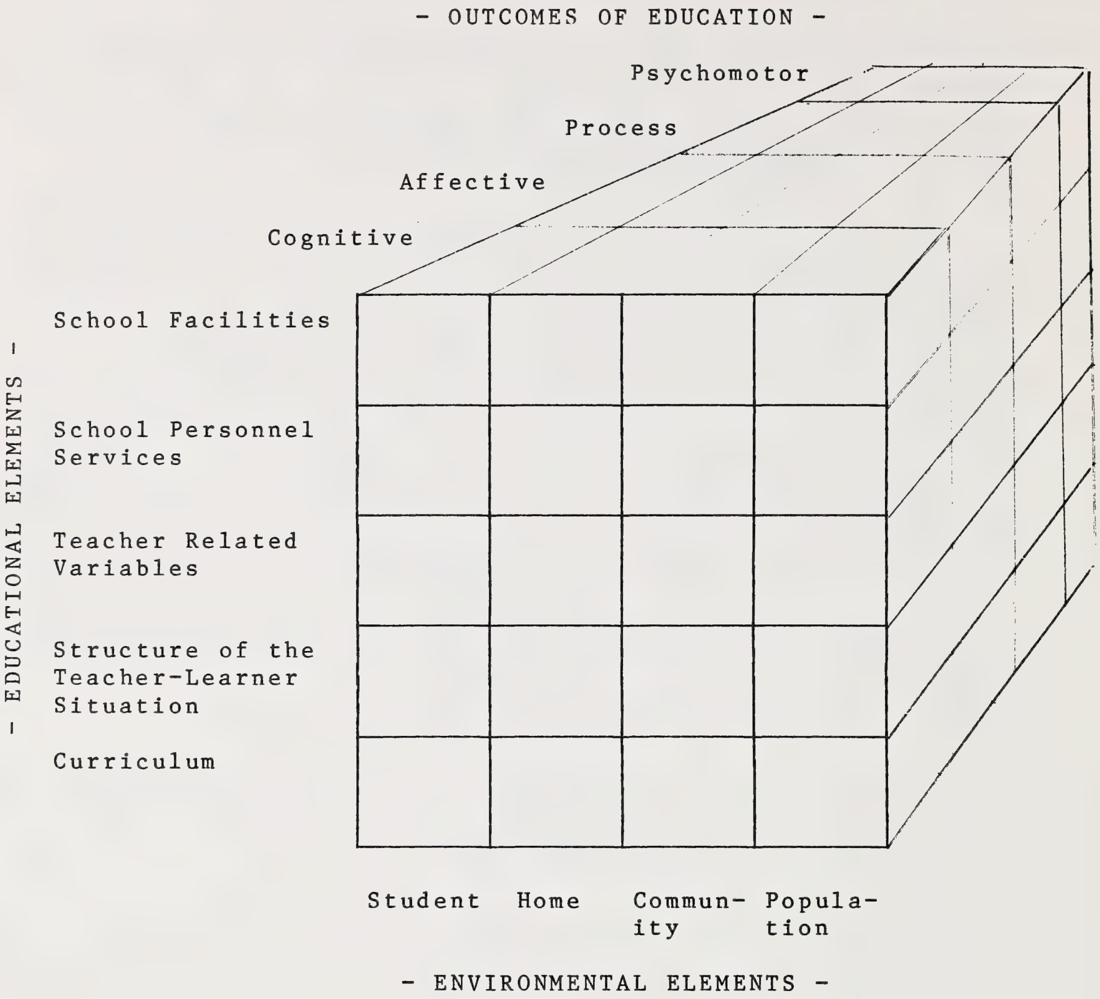
- OUTCOMES OF EDUCATION -
Psychomotor
Process
Affective
Cognitive
- EDUCATIONAL ELEMENTS -
School Facilities
School Personnel Services
Teacher Related Variables
Structure of the Teacher-Learner Situation
Curriculum
Student
Home
Community
Population
- ENVIRONMENTAL ELEMENTS -

Figure 4
Interactions In, And Results Of
The Educational Process

Summary

The elements affecting student success (predictor variables) have been classified under two areas: Environmental Elements and Educational Elements having to do with non-formal educational aspects and with the formal educational aspects of society, respectively. The impact on achievement of these two sets of elements is indicated within four domains representing the Outcomes of Education: cognitive, affective, process and psychomotor. The interactions between the predictor variables and the criterion variables are illustrated in Figures 3 and 4. Figure 4 represents the interactions of the three areas: Environmental Elements, Educational Elements and Outcomes of Education. This summation illustrates another concern of this paper: the identifiable interactions resulting in the education of the student.

CHAPTER III

RESEARCH REVIEW

Findings

Elements related to student success were listed in Tables 2 through 8. Fifty-three studies were reviewed with respect to these elements. Summary information about results from these studies including keys to source documents appears in Tables 18 through 25. (See appendix).

In Tables 13 and 14 in this section and in Tables 18 to 25 in the appendix the results are displayed as follows:

1. The criteria variables indicating cognitive and affective domains are similar to those listed in Table 12;

2. The associations between predictors and criteria are reported as correlations only (i.e., not to be inferred as cause-effect)

   +s = significant and positive relationship (predictor and criterion covary; as one increases or decreases, so does the other)

   -s = significant and negative relationship (as one variable increases the other decreases and vice versa)

   s = significant relationship, direction not reported (probably positive)

   ns = no significant relationships reported

3. Each study reference is numbered in the tables in the appendix and is keyed as to the source of the report listed in the References and Bibliography.

Table 13 indicates the following findings from the examination of fifty-three studies:

Emphasis on Type of Predictor

- More criteria of student success have been used in studies in relation to environmental elements (149) than in relation to educational elements (113).

- Within the environmental elements category nearly half the studies (24) examined home characteristics of the student. Next in frequency was the student characteristics category (17) while community and population characteristics were seldom studied

Table 13

SUMMARY OF RELATIONSHIPS BETWEEN VARIOUS PREDICTORS AND CRITERIA: FREQUENCIES IN STUDIES TABULATED IN APPENDIX

Predictor	Proportion Of Fifty-Three Studies	Number Of Criteria Studied	**Criterion**							
			Cognitive Outcomes				Affective Outcomes			
			+s[1]	-s	s	ns	+s	-s	s	ns
Environmental Elements:										
Population Characteristics	2/53	5	4			1				
Community Characteristics	8/53	18	6	3	6		2		1	
Home Characteristics	24/53	77	37	5	25	1	4		5	
Student Characteristics	17/53	49	15	3	9	8	4	2	3	5
TOTALS		149	62	11	40	10	10	2	9	5
Educational Elements:										
School Facilities	16/53	28	3	8	6	7	2	1		1
School Personnel Variables	2/53	4		2			2			
Teacher Related Variables	24/53	63	18	3	16	17	5		3	1
Structure of Teaching-Learning Situation	6/53	14	8	1	1	3	1			
Curriculum	3/53	4	1			2			1	
TOTALS		113	30	14	23	29	10	1	4	2

[1] +s = significant and positive correlation
-s = significant and negative correlation
s = significant correlation or—not stated
ns = no significant correlation

Table 14

SUMMARY OF RELATIONSHIPS BETWEEN VARIOUS PREDICTORS AND CRITERIA:
PROPORTIONS IN STUDY RESULTS TABULATED IN APPENDIX

Predictor	Proportion of Fifty-Three Studies	Number Of Criteria Studied	Criterion									
			Cognitive Outcomes Proportion (%) of Relationships					Affective Outcomes Proportion (%) of Relationships				
			Significantly Related				Unrelated	Significantly Related				Unrelated
			+s[1]	-s	s	Total		+s	-s	s	Total	
Environmental Elements:												
Population Characteristics	2/53	5	3.2				0.8					
Community Charcteristics	8/53	18	4.9	2.4	4.9			7.7		3.8		
Home Characteristics	24/53	77	30.1	4.1	20.3		0.8	15.4		19.2		
Student Characteristics	17/53	49	12.2	2.4	7.3		6.5	15.4	7.7	11.5		19.2
TOTALS		149	50.4	8.9	32.5	91.8	8.1	38.5	7.7	34.6	80.8	19.2
Educational Elements:												5.9
School Facilities	16/53	28	3.1	8.3	6.3		7.3	11.8	5.9			
School Personnel Variables	2/53	4		2.1								
Teacher Related Variables	24/53	63	18.7	3.2	16.7		17.7	11.8				
Structure of Teaching-Learning Situation	6/53	14	8.3	1.0	1.0		3.1	29.4		17.6		5.9
Curriculum	3/53	4	1.0				2.1	5.9				
TOTALS		113	31.2	14.6	24.0	69.8	30.2	58.8	5.9	17.6	88.2	11.8

[1] +s = significant and positive correlation
-s = significant and negative correlation

s = significant correlation or—not stated
ns = no significant correlation

- Teacher Related Variables (24) were the most popular focus within the Educational Elements category. The next most popular type of variable was School Facilities (16) with Teaching-Learning Situation, Curriculum, and School Personnel Services appearing relatively rarely.

Tables 13 and 14 display the information about relationships between predictor and criterion categories.

Relationships Revealed According to Type of Predictor

- A larger proportion of relationships between predictor and criterion were found to be statistically significant for the Environmental category (134/149 or 90%) than for Educational Elements (82/113 or 73%). This finding supports the conclusion that non-school elements are more consistently related to outcomes.

- Within the Environmental set of predictors the proportion of statistically significant relationships is uniformly high. The proportions are as follows: Community Characteristics, 100%; Home Characteristics, 97%; Student Characteristics, 92%; and Population Characteristics, 80%.

- Within the Educational set of predictors the proportion of statistically significant relationships with criteria of student success are generally lower and more inconsistent. The proportions are as follows: School Personnel Services, 100%; Structure of Teaching-Learning Situation, 78.5%; Teacher Related Variables, 71%; School Facilities, 71%; and Curriculum, 50%.

Emphasis on Type of Criterion

- Over all, the investigators in the studies reviewed emphasized the use of indicators of cognitive outcomes; 219/262 or 84% of outcomes were of this type while 43/262 or 16% were measures of the affective domain. The psychomotor and process domains have been virtually ignored.

Relationships Revealed According to Type of Criterion

- A similar proportion of cognitive and affective outcomes were found to be statistically significantly correlated with predictors; 180/219 or 82% of the cognitive indicators and 36/43 or 84% of the affective ones. Where affective domain measures were used, a similarly large proportion (over 80%) were shown to be related to the predictors even though the vast majority of studies (84% vs. 16%) employed cognitive rather than affective criteria.

Relationships Revealed According to Types of Predictors and Types of Criteria

- 113/123 or 92% of the environmental elements vs. cognitive outcomes relationships were statistically significant.

- 67/96 or 70% of the educational elements vs. cognitive outcomes relationships were statistically significant.

- The conclusion relative to cognitive outcomes is that environmental factors were more frequently found to be related to the criteria than were the school-based ones.

- 21/26 or 81% of the environment vs. affective outcomes relationships were shown to be statistically significant.

- 15/17 or 88% of the education elements vs. affective outcomes relationships were shown to be statistically significant.

- Accordingly, little difference was noted between sources of predictor when the attitudes enumerated in Table 12 were used as criteria.

The general conclusion concerning type of predictor variable and the association with outcomes is that frequently an association is found between non-school (environmental) factors and cognitive outcomes. Almost as frequently either school-based (educational) or non-school factors are found to be related to affective concerns. However, school-based factors are found to be associated with cognitive outcomes far less frequently.

Elements Positively Related to Student Achievement

Table 15 enumerates indicators of both environmental (non-school) and educational (school-based) elements positively related to student development in each of the cognitive and affective domains. In a few instances the strength of the relationship is reported. For such studies the coefficients of correlation (r) are noted parenthetically.

For example, a number of indicators of characteristics of the home are reported to be positively associated with cognitive achievement. The value of the coefficient is bracketed. Squaring the coefficient provides an indication of the percent of the variance in cognitive achievement associated with the predictor: socio-economic level of the home, r = .26 (6.7%); median family income, r = .88 (77.4%); living with both parents, r = .83 (68.9%); parents' attitude level toward child's education, r = .56 (31.4%); and parent's ambitions toward the child's future, r = .46 (21.1%).

Table 15

SOME FACTORS POSITIVELY RELATED TO STUDENT ACHIEVEMENT

FACTORS	COGNITIVE OUTCOMES	AFFECTIVE OUTCOMES
Population Characteristics	Racial mix	
Community Characteristics	Race and culture	Socio-economic level
Home Characteristics	Socio-economic level (.26)[1]	Parents' occupations
	Median family income (.88)	Family impact
	Living with both parents (.83)	Community type
	Parents' education (.63)	Parental attitude toward education
	Parents' attitude toward children's education (.56)	Socio-economic level (.33)
	Parents' ambitions for children's futures (.46)	
	Parents' aspirations	
	Use of books in the home	

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[1] When known, representative correlation coefficients describing strengths of relationships between specified factors and achievement appear in brackets. Reports which are referenced in the bibliography which express strengths of relationships as coefficients or percentages of variance accounted for are keyed to the following numbers: 1, 3, 11, 19, 21, 25, 34, 39, 40, 42, 43, 47, 48, and 53.

Table 15 (cont'd)

SOME FACTORS POSITIVELY RELATED TO STUDENT ACHIEVEMENT

FACTORS	COGNITIVE OUTCOMES	AFFECTIVE OUTCOMES
Student Characteristics	Attitude (.40) Educational plans (.48)	Race
School Facilities	Library	Library
Teacher Related Variables	Higher teachers' salaries More teacher graduate training Teacher satisfaction related to students Teacher satisfaction related to parents	Teacher satisfaction with students
Structure of the Teaching-Learning Situation	Better control of classes Greater teacher warmth (.30) Emphasis on cognitive development More silent reading Higher teacher expectations Higher teacher perceptions Students matched with learning situation	Matching of students with desired learning situation

Table 16 displays indicators of factors negatively related to student development. That is, the predictor's value varies inversely with the value of the criterion; as one declines the other increases and vice versa.

indicators of pupil development increase. The following will illustrate: the more overcrowded the housing, the lower the academic development, r = -.69 (47.6% of the variance in cognitive achievement accounted for); the greater the limitation of educational attainment of adults in the home, the lower the pupils' academic achievement, r = .73 (53.3%); larger family size, r = .24 (5.8%); and absence of library services, r = -.53 (28.1%).

Table 16

SOME FACTORS NEGATIVELY RELATED TO STUDENT ACHIEVEMENT

FACTORS	COGNITIVE OUTCOMES	AFFECTIVE OUTCOMES
Community Characteristics	Larger district enrollment Overcrowded housing (-.69)	
Home Characteristics	Limited adult educational attainment Larger family size (-.55) Parents divorced (-.24)	
Student Characteristics	Juvenile delinquency	Drug usage Part-time work
School Facilities	No library services (-.53)	Class size
School Personnel Services[2]	More pupil services Special programs for the handicapped	

[2] At first glance one would expect additional services and programs to be positively related to achievement, but in reality such services may exist primarily where achievement is especially low.

The question of the extent to which various predictors are correlated with particular criteria used to measure pupil development for a particular group is an empirical one. That is, appropriate predictor data simply need to be collected and correlated with achievement information. The resulting coefficients indicate how predictive the former is of the latter. The dearth of coefficients recorded parenthetically in Tables 15-17 indicate that there is a paucity of information about actual strengths of relationships reported in the sources reviewed.[3] However, the indicators used and the general relationships to outcomes are reported. This information will be useful to persons wishing to select indicators in predicting achievement levels (i.e. in setting standards) for the evaluation of student achievement for particular groups.

In selecting predictors to provide estimates for standard-setting, the information in Table 17 about elements found to be unrelated or ambiguously (inconsistently) related to pupil development is instructive. The following were found to be unrelated or ambiguously related to cognitive outcomes: attendance, sex of student, facilities and space, class size, per-pupil expenditures and median age of teachers. Those predictors reported as unrelated or ambiguously related to affective development were 1) in the home--material possessions and political and/or religious preference, and 2) by the student--educational plans, clique membership and race.

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[3] A volume of readings received too late to include in this analysis contains considerable information about the strengths of association between outcomes and various context (environmental) input and process (educational) variables. In particular, see Chapters by Marjoribanks (family environments), Welch (learning environments), Power and Tishner (instructional environments), Cort, and Wolf, Levine et al (macro environments) in H. J. Wahlberg, Educational environments and effects: Evaluation, policy and productivity. Berkeley: McCutchan Publishing Corporation, 1979.

Table 17

SOME FACTORS NOT RELATED OR AMBIGUOUSLY RELATED TO STUDENT ACHIEVEMENT

FACTORS	COGNITIVE OUTCOMES	AFFECTIVE OUTCOMES
Home Characteristics		Material possessions Political and/or religious preferences
Student Characteristics	Attendance rate Sex of student	Educational plans Clique membership Race
School Facilities	School facilities and space Class size Per-pupil expenditures	
Teacher-Related Variables	Median age of teacher	

On the basis of the studies reviewed, the foregoing predictors are not good candidates for establishing expectations for use in evaluation programs.

Interactions Between Environmental and School Based Elements

Few of the references reviewed for this paper reported results of interaction effects between non-school and school-based factors. The reader is referred to a companion paper prepared for the Minister's Advisory Committee on Student Achievement by Dr. Larry Fedigan.[1] Part II of the Fedigan review discusses the joint effect on achievement of context and process variables. Part II of the companion document (entitled Context Variables) discusses three types of context variables: organizational, program and student characteristics. The review of the effects of these is organized under the topics of classroom climate, teacher expectations, pupil characteristics, and mastery learning.

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[1] L. Fedigan School-based elements related to achievement: A review of the literature. Edmonton: Alberta Education, 1979.

Fedigan concluded that there were several interaction effects which consistently appeared in research results. One is direct instruction (a process variable) for young disadvantaged pupils requiring compensatory education (a student characteristics variable). This combination has provided consistent educational benefits in both short-term and longitudinal studies. A differential effect in achievement has been noted since elementary pupils from advantaged backgrounds tend to benefit as much from other approaches.

Peterson[2] reviewed seven studies which also explored the interaction effect between student characteristics and type of instruction (open and traditional). She reported on studies which had examined the interaction effect on various kinds of achievement of openness of instruction with student levels of ability, achievement, motivation, sociability, anxiety and locus of control. For some outcomes a particular combination of student characteristic and instructional approach was found to be most appropriate: students high in internal locus of control achieved both cognitive and affective outcomes at a higher level in open approaches.

Fraser and Cort[3] both confirmed the findings from many studies--that aptitude carries the greatest weight in accounting for student outcomes. However, Fraser found that instruction-learning environment interactions also contributed to prediction.

The matching of student preferences for a learning situation (a student characteristic) with the teaching approach (a process variable) has been studied by Hunt and Sullivan (1974) and in Alberta by Gay (1976). These studies report measurable impacts on achievement thus pointing up the importance of identifying teaching modes and student preferences, and matching the two.

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[2] P. L. Peterson, Direct instruction reconsidered, in P. L. Peterson and H. J. Wahlberg (Eds.) Research on teaching: Concepts, findings and implications. Berkeley: McCutchan Publishing Corporation, 1979.

[3] B. J. Fraser, Evaluation of a science curriculum. H. R. Cort Jr., A Social Studies evaluation. In H. J. Wahlberg (Ed.), Educational environments and effects: Evaluation, policy and productivity. Berkley: McCutchan Publishing Corporation, 1979.

CHAPTER IV

CONCLUSIONS, DISCUSSION AND IMPLICATIONS

The problems delineated in Chapter I provided direction for gathering and reporting data. This chapter will address these problems by communicating conclusions drawn from the results reported in Chapter III and tabulated in detail in the appendix. In addition, the conclusions will be discussed in terms of related research and possible implications and applications.

The major task in reviewing the literature was to report the current state of knowledge about which factors were related to student achievement. These were dichotomized, in a fashion similar to the Alberta Goals of Education, as either school-based or originating from outside formal education settings (environmental). The interaction or combined effect of the two types of elements was also a topic explored.

In the correlational-type studies selected for review, more environmental variables were selected as predictors than school-based ones. This may be a function of the relative difficulties experienced in data-gathering; researchers can more economically gather accurate information about characteristics of the student, his home and community than about the education processes experienced. Within the environmental elements category characteristics of the home predominated, followed by characteristics of the student, and this too may reflect the ease with which data may be collected. The same explanation may apply to the choice of variable within the school-based category: easy-to-gather data about teacher characteristics predominated, followed by school facilities, but information about teaching and learning procedures was given short shrift. This latter finding coincides with one by Fedigan[4] in his companion review on School-Based Elements Related to Achievement. Fedigan concluded that among the impediments to generating a large and coherent body of research data about schooling were a paucity of researchers working in this area and limited funding.

Most of the elements selected by researchers were found to be correlated with student achievement, particularly those from the Environmental category. Ninety-percent of these were significantly related to student achievement and within the environmental set of predictors the proportions by sub-categories were uniformly high, ranging from 80 percent (population characteristics) to 100 percent (community characteristics). Accordingly, the recognition of the significance of non-school factors in the Alberta goals of education is warranted.

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[4] Ibid, p. 95.

An implication is that information of this type could contribute to setting expectation levels for student achievement and thus aid in interpreting the adequacy of achievement. An application of this approach was suggested in articles by Barro, Dyer and Wildavsky[5] and more recently in reports on an assessment program in Pennsylvania by Guerriero[6] and Coldiron and Skiffington (1975). Some of the variables used in that state for predicting expected achievement levels are of this type; schools receive reports on their individual performance in terms of the context in which they operate and the characteristics of the clientele they serve. As a consequence, not only may a school judge the adequacy of the achievement of its student body by comparing levels with the state norm but it may also use the predicted level based on variables shown to be correlated with its achievement. The predicted (expected) levels are idiosyncratic to each school. Since these expectations reflect the unique environment in which the school functions, a fair, just and realistic expectation is used in judging adequacy of achievement to complement comparisons with state averages.

The predictors used in the Environment category represent elements over which the educational community has little control or responsibility. In contrast, the set of elements in the School-based category are amenable to manipulation by those responsible for education. Within the school-based set the review showed that a lower proportion (73 percent) was found by investigators to be correlated with student achievement. In comparison with Environmental elements they were found, generally, to be less consistently associated with achievement; the range extended from 50 percent (for curriculum) to 100 percent (for the school personnel variable). Perhaps knowledge of the relationships between school-based elements and achievement is most useful in planning changes in programs. Consequently, it has utility in supervision and management decisions about instruction. These types of data have application in deciding 'how' weaknesses may be ameliorated whereas environmental data help in setting expectations for deciding 'what' requires attention.

The types of criterion measures used in the studies reviewed likely reflect the social context in which the studies were conducted. By far the greatest proportion of outcome indicators used was in the academic achievement or cognitive area (84%) and the remaining proportion was from the affective domain (16%). The psychomotor and process domains were not represented. Goals and objectives from the affective, psychomotor and process areas will need to be accorded higher priority by those initiating and funding research of this type if a more equitable balance is to be achieved. Evaluation research appears to be lagging behind curriculum development in increasing the priority to non-cognitive outcomes.

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[5] S. M. Barro, H. S. Dyer and A. Wildavsky in Phi Delta Kappan, 52 (4), Dec. 1970, 196-216.

[6] C. A. Guerriero, Assessing attitudes and values in Pennsylvania schools Educational Leadership, January 1977, 268-271.

Although relatively fewer relationships between predictors and affective outcomes were studied, for those that were investigated a substantial proportion (84%) was shown to be related to the criteria. The corresponding proportion for cognitive outcomes was 82 percent. The analyses of findings with respect to type of predictor versus type of criterion revealed the following: 1) Environmental factors are associated more frequently than school-based ones with cognitive outcomes (90% and 70% respectively), and 2) both environmental and school-based elements were frequently found to be significantly related to affective outcomes (81% and 88%). The general conclusion is that environmental and school-based variables are both often associated with affective outcomes. However, only variables from the Environment category are found to be very frequently related to cognitive outcomes.

These findings have implications for collecting, interpreting and reporting information about student achievement. Since cognitive concerns such as academic achievement will clearly remain an area of interest, it would be appropriate and useful to incorporate Environment type data in the assessment procedures. In addition, since the manipulatable elements (school-based factors) are frequently associated with affective outcomes it should be attractive to measure more frequently in the affective domain. This last suggestion is, of course, contingent upon the area of attitudes and feelings being accorded higher priority in evaluations of student development. Finally, the dearth of studies involving psychomotor and process outcomes is revealing. Obviously, these have been accorded low status. There is no data base from the current review to permit conclusions or suggestions.

Only some of the investigations reviewed included reports of the strength of the association between predictor and criterion. This is unfortunate since such information would aid in selecting promising variables for use in assessment programs. However, the extent to which a predictor will covary with a criterion may vary with the population being studied. The question about how well one predicts the other for a particular group is always an empirical one. Accordingly, prospective users should simply correlate indicators and select those that contribute to efficiency of prediction for the particular target population.

Another question posed to guide the review was with respect to the interaction effects on achievement of variables from different dimensions. Use of interactions in predicting academic success was recommended in a review by Lavin[7] as long ago as 1965. More recently, Wahlberg[8] also advocated this approach and suggested multiple regression models for use with three predictors selected from the students' backgrounds (aptitude), classroom climates, and instructional modes. Wahlberg has pointed out that aptitude data will likely account for most of the variance in achievement and should be entered first, followed by climate information, with the instructional variable entered last (since relatively little contribution to variance in achievement will be provided by variations in instruction).

Wahlberg's pessimism about the utility of indicators of instruction in determining interactions for forecasts of achievement is countered, in part, by Hunt and Sullivan (1974) and Gay (1976). These investigators found an interaction between teaching mode (high and low inquiry) and pupil's learning preferences on this dimension.

Fedigan's Review (1979) indicated a consistent interaction associated with academic achievement between an instruction mode (degree of structure i.e. directness of teaching) and socio-economic levels of students; young disadvantaged pupils in need of compensatory instruction benefit most from direct teaching.

If one were to use indicators of the student characteristics and instructional variables noted above, and determine the interaction effects of these on indicators of achievement, the interaction data could in turn be used in predictions. The effectiveness of Wahlberg's prediction model would be improved, for example, if the interaction effects of the particular student characteristics and instructional approaches cited above were included in an equation.

Of course knowledge about interaction effects has use beyond computing expected levels of achievement. Individualizing instruction by matching student characteristics with teaching mode is one obvious use. Bloom (1977) in his article "Affective Outcomes of Student Learning" has reviewed studies on attitude toward school and self-concept-as-a-student which show these outcomes declining over time for low achieving students. High achieving students tend to maintain their scores on these attitude measures. He calls for differentiation of school instruction and home experiences to accommodate the needs of students who have negative perceptions of themselves as students and are negatively disposed toward school. Both the school and the home need to match their treatment of the student with his or her perceptions about self and the school in order to ameliorate the effects of negative perceptions on achievement.

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[7] D. E. Lavin, The prediction of academic performance: A theoretical analysis and review of research. New York: Russel Sage Foundation, 1965.

[8] H. J. Wahlberg, Models for optimizing and individualizing school learning, Interchange. 1971, 2(3), 15-27.

Bloom's article underlines a number of points reiterated throughout this paper. These include the notion, reflected in the Alberta Goals of Education, that both schools and non-school agencies (e.g. the family) have roles to play in fostering student learning. The evidence gathered in this review provides empirical support for the dichotomy between school and non-school factors; both types of elements are associated with student achievement, with non-school factors correlating more frequently and strongly with academic achievement than with affective outcomes.

Since both school-based and environmental elements were found in the review to be frequently related to affective outcomes, support is provided for Bloom's advocacy of a combined home and school thrust for improving attitudes.

A conclusion noted earlier was the type of outcome receiving emphasis in the studies reviewed. Academic and cognitive criteria have been emphasized, with minor attention to attitudes and feelings. No studies were reviewed which used process skills or psychomotor outcomes as the criterion. It was also noted that evaluation research and development are lagging behind curriculum activities in this regard where, increasingly, goals and objectives representing outcomes from the affective, psychomotor, and process areas are receiving attention. One implication is that assessments of student achievement need to reflect more accurately the breadth and variety of goals implied and explicated in the curriculum. A second implication is with regard to instruction. Feedback to teachers and pupils about their achievements in teaching and learning of the affective, psychomotor, and process objectives might do much to ameliorate the concern expressed by Bloom; more pupils might be shown to be successful in these aspects of schooling.

PROPOSALS

It is suggested that:

1. Since the educational interaction is complex, expectations and standards based on a regression equation developed from environmental elements be identified for use in student assessments.

It is not logical to compare the results of a student from location A and school B with a student from location X and school Y without recognizing the vast number of elements contributing to each student's degree of success. At least some of the significant ones should be considered.

2. Ways and means of gathering information on the elements associated with student success be established for use in Alberta.

3. The ways and means of matching students with appropriate learning environments be considered a high priority in Alberta Education.

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APPENDIX

Detailed tabulations of results.

Table 18(2)--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY ENVIRONMENTAL ELEMENTS IN POPULATION

Predictor Variable	Studies Which Examined This Input			Outcomes							
	Proportion Of Fifty-Three	Study Reference Numbers	Number Of Criteria Studied	Cognitive				Affective			
				+s	-s	s	ns	+s	-s	s	ns
Population Characteristics											
1. Achievement mix											
2. Racial mix	2/53	19,23	5	4			1				
3. Socio-economic mix											
TOTAL		2	5	4			1				

NOTE: the table number in parenthesis references a particular table in the main report. Correlations: +s = significant and positive; -s = significant and negative; s = significant or--not stated; ns = no significant

Table 19(2)--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY ENVIRONMENTAL ELEMENTS IN COMMUNITY

Predictor Variable	Studies Which Examined This Input			**Outcomes**							
	Proportion Of Fifty-Three	Study Reference Numbers	Number Of Criteria Studied	Cognitive				Affective			
				+s	-s	s	ns	+s	-s	s	ns
Community Characteristics											
1. Housing type	1/53	19	2	2							
2. Race and culture	2/53	3,7	7	1		5				1	
3. Community type:											
a. Inner city	2/53	10,23	2		1	1					
b. Rural/urban	1/53	10	3		1			2			
c. Suburban	1/53	10	1	1							
4. Education plans											
5. Socio-economic mix											
6. Median achievement mix											
7. Per capita income	1/53	36	1	1							
8. Residents in Who's Who	1/53	13	1	1							
9. Large school enrollment	1/53	52	1		1						
TOTAL		8	18	6	3	6		2		1	

NOTE: the table number in parenthesis references a particular table in the main report. Correlations: +s = significant and positive; -s = significant and negative; s = significant or--not stated; ns = no significant

Table 20(2)--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY ENVIRONMENTAL ELEMENTS IN HOME

Predictor Variable	Studies Which Examined This Input		Number Of Criteria Studied	Outcomes							
	Proportion Of Fifty-Three	Study Reference Numbers		Cognitive				Affective			
				+s	-s	s	ns	+s	-s	s	ns
Home Characteristics											
1. Socio-economic status factors:	2/53	36,48	8	6	1			1			
a. Parent's occupation	2/53	10,31	5	3				1		1	
b. Parent's education	7/53	11,19,23,31 37,40,45	12	9		3					
c. Income	5/53	3,6,45,47	10	5		5					
d. Material possessions	3/53	11,23,32	5	1		2				2	
2. Reading material available	2/53	11,32	2	1		1					
3. Political preference and knowledge	1/53	3	3	2							1
4. Religious preferences and knowledge	1/53	3	3	1		1					1
5. a. Family intact	3/53	3,7,45	7	3		3		1			
b. Divorced	1/53	7	1		1						
6. a. Real or surrogate mother at home	1/53	31	1					1			
b. Working mother	1/53	7	1					1			

Table 20(2) con't--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY ENVIRONMENTAL ELEMENTS IN HOME

Predictor Variable	Studies Which Examined This Input			**Outcomes**							
				Cognitive				Affective			
	Proportion Of Fifty-Three	Study Reference Numbers	Number Of Criteria Studied	+s	-s	s	ns	+s	-s	s	ns
Home Characteristics											
7. Overcrowding	2/53	3,7	3		1	2					
8. Family size	5/53	4,7,11,23,31	6	2	1	2		1			
9. Parental attitude:											
a. Expectation and interest	5/53	10,11,33,40 44	5	2		3					
b. Attitude towards education	4/53	10,31,46	6	1		1	1	3			
c. Aspirations	3/53	11,33,40	3	1		2					
10. Home climate											
TOTAL		25	81	37	5	25	1	4		5	

NOTE: the table number in parenthesis references a particular table in the main report. Correlations: +s = significant and positive; -s = significant and negative; s = significant or--not stated; ns = no significant

Table 21(2)--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY ENVIRONMENTAL ELEMENTS IN STUDENTS' BACKGROUNDS

Predictor Variable	Studies Which Examined This Input		Number Of Criteria Studied	**Outcomes**							
	Proportion Of Fifty-Three	Study Reference Numbers		Cognitive				Affective			
				+s	-s	s	ns	+s	-s	s	ns
Student Characteristics											
1. Academic readiness:											
a. I.Q.	1/53	21	2	2							
b. Composite achievement											
c. Previous test scores											
d. Levels of previous education											
e. Kindergarten	2/53	11,31	2	1				1			
2. Motivation:											
a. Lateness, attendance	1/53	52	1				1				
b. Study habits											
c. Job attitudes	1/53	3	1	1							
d. Educational plans, desires, expectations	5/53	2,3,10,22,23	9	2		5					2
e. Attitude	2/53	3,4	4	3	1						
f. Registered for high school	1/53	7	1	1							
3. Social Existence:											
a. Clique membership	1/53	15	4			1	1			2	
b. Social values											

Table 21(2) con't--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY ENVIRONMENTAL ELEMENTS IN STUDENTS' BACKGROUNDS

Predictor Variable	Studies Which Examined This Input			**Outcomes**							
				Cognitive				Affective			
	Proportion Of Fifty-Three	Study Reference Numbers	Number Of Criteria Studied	+s	−s	s	ns	+s	−s	s	ns
Student Characteristics											
c. Delinquency	2/53	2,7	2		1		1				
d. Drug usage	1/53	26	2			1			1		
e. Participation in other activities											
f. Disruptive actions											
g. Part-time work	1/53	18	1						1		
h. Time available for school and homework	1/53	25	1			1					
i. Mobility	1/53	52	1				1				
4. Personal characteristics:											
a. I.Q.	1/53	21	2	2							
b. Age	1/53	31	1	1							
c. Sex	3/53	10,44,46	5		1	1	2				1
d. Race	1/53	10	10	2			2	3			3
e. Second generation											
TOTAL		17	49	15	3	9	8	4	2	3	5

NOTE: the table number in parenthesis references a particular table in the main report. Correlations: +s = significant and positive; −s = significant and negative; s = significant or--not stated; ns = no significant

Table 22(4)--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY EDUCATIONAL ELEMENTS IN SCHOOL FACILITIES

Predictor Variable	Studies Which Examined This Input		Number Of Criteria Studied	**Outcomes**							
	Proportion Of Fifty-Three	Study Reference Numbers		Cognitive				Affective			
				+s	-s	s	ns	+s	-s	s	ns
School Facilities											
1. Age of building, value, maintenance	1/53		1				1				
2. Auxiliary facilities:											
a. Gym	1/53	11	2				2				
b. Cafeteria											
c. Library	3/53	10,18	5	3				2			
3. Size and location:											
a. Site size											
b. Number of pupils	3/53	6,52,53	4		2		1				1
c. Number of pupils per teacher	1/53	30	1		1						
d. Class size	7/53	2,8,38,45,48 51,52	11		5	3	2		1		
4. Transportation:											
a. Expenditures	2/53	14/45	2			2					
5. Net expenditures	2/53	16/21	2				1	1			
TOTAL		16	28	3	8	6	7	2	1		1

NOTE: the table number in parenthesis references a particular table in the main report. Correlations: +s = significant and positive; -s = significant and negative; s = significant or--not stated; ns = no significant

Table 23(5)--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY EDUCATIONAL ELEMENTS IN SCHOOL SERVICES

Predictor Variable	Studies Which Examined This Input		Number Of Criteria Studied	**Outcomes**							
				Cognitive				Affective			
	Proportion Of Fifty-Three	Study Reference Numbers		+s	-s	s	ns	+s	-s	s	ns
School Personnel Serivces											
1. Counselling: a. Accessability	1/53	10	2					2			
2. Number of specialists											
3. Number of pupil services	1/53	52	1		1						
4. Programs for the handicapped	1/53	52	1		1						
TOTAL		2	4		2			2			

NOTE: the table number in parenthesis references a particular table in the main report. Correlations: +s = significant and positive; -s = significant and negative; s = significant or--not stated; ns = no significant

Table 24(6)--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY EDUCATIONAL ELEMENTS: TEACHER VARIABLES

Predictor Variable	Studies Which Examined This Input		Number Of Criteria Studied	**Outcomes**							
	Proportion Of Fifty-Three	Study Reference Numbers		Cognitive				Affective			
				+s	-s	s	ns	+s	-s	s	ns
Teacher-Related Variables											
1. Instructional costs (salaries)	4/53	21,25,39,52	4	2		1	1				
2. Teacher stability:											
a. Percent of transfers											
b. Turnover rate											
3. Teacher satisfaction related to:											
a. Students	2/53	10,31	7	3				4			
b. Parents	1/53	10	6	2		1		1		2	
c. Administration											
1) Qualifications of principal	1/53	2	1				1				
2) Administrator type											
3) Perceptions of staff needs	2/53	2,52	2	1			1				
4) Higher personnel ratings	1/53	52	1	1							
d. Teaching load	2/53	8,53	2		1	1					

Table 24(6) con't--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY EDUCATIONAL ELEMENTS: TEACHER VARIABLES

Predictor Variable	Studies Which Examined This Input		Number Of Criteria Studied	**Outcomes**							
	Proportion Of Fifty-Three	Study Reference Numbers		Cognitive				Affective			
				+s	-s	s	ns	+s	-s	s	ns
Teacher-Related Variables											
4. Qualifications:											
a. Years of training, number of degrees	6/53	10,11,21,25 48,52	8	4		2	1			1	
b. Quality of training	2/53	4,6,53	2				2				
c. Years of experience	9/53	6,11,23,27,31 51,52,53	10	3		4	3				
d. Uncertified teachers	1/53	52	1		1						
e. Inservices	1/53	25	1			1					
f. Hours of practice teaching											
g. Others											
1) Travel											
2) Reading											
5. Teacher background and characteristics:											
a. Social class	1/53	28	1		1						
b. Sex	4/53	10,14,25,52	4	1		2	1				
c. Parent's education	3/53	10,11,37	11	1		4	5				1
d. Race											

Table 24(6) con't--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY EDUCATIONAL ELEMENTS: TEACHER VARIABLES

Predictor Variable	Studies Which Examined This Input		Number Of Criteria Studied	**Outcomes**							
	Proportion Of Fifty-Three	Study Reference Numbers		Cognitive				Affective			
				+s	-s	s	ns	+s	-s	s	ns
Teacher-Related Variables											
e. Married	1/53	52	1				1				
f. Age	1/53	52	1				1				
TOTAL		24	63	18	3	16	17	5		3	1

NOTE: the table number in parenthesis references a particular table in the main report. Correlations: +s = significant and positive; -s = significant and negative; s = significant or--not stated; ns = no significant

Table 24(7)--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY EDUCATIONAL ELEMENTS: TEACHING-LEARNING

Predictor Variable	Studies Which Examined This Input		Number Of Criteria Studied	**Outcomes**							
	Proportion Of Fifty-Three	Study Reference Numbers		Cognitive				Affective			
				+s	-s	s	ns	+s	-s	s	ns
Structure of the Teaching-Learning Situation											
1. Classroom climate:											
a. Teacher expectations	3/53	12,16,52	4	1		1	2				
b. Teacher perceptions	1/53	52	1	1							
c. Environment (warmth, praise)	1/53	52	1	1							
d. Control	1/53	52	2	2							
e. Disorganization											
2. Classroom practices:											
a. Grouping (ability, etc.)	2/53	2,52	2	1			1				
b. More oral reading	1/53	52	1		1						
3. Matching of students with desired learning situation	2/53	20,24	3	2				1			
TOTAL		6	14	8	1	1	3	1			

NOTE: the table number in parenthesis references a particular table in the main report. Correlations: +s = significant and positive; -s = significant and negative; s = significant or--not stated; ns = no significant

Table 25(8)--OUTCOMES OF STUDENT EDUCATION AS PREDICTED BY EDUCATIONAL ELEMENTS: CURRICULUM

Predictor Variable	Studies Which Examined This Input			**Outcomes**							
				Cognitive				Affective			
	Proportion Of Fifty-Three	Study Reference Numbers	Number Of Criteria Studied	+s	-s	s	ns	+s	-s	s	ns
Curriculum											
1. Currency of program	1/53	11	2				2				
2. Innovation and use of new material	1/53	21	1							1	
3. Quality											
4. Number of credits offered	1/53	8	1	1							
5. Closeness to real life											
TOTAL		3	4	1			2			1	

NOTE: the table number in parenthesis references a particular table in the main report. Correlations: +s = significant and positive; -s = significant and negative; s = significant or--not stated; ns = no significant

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